

AGS Polarization Efficiency and Plans

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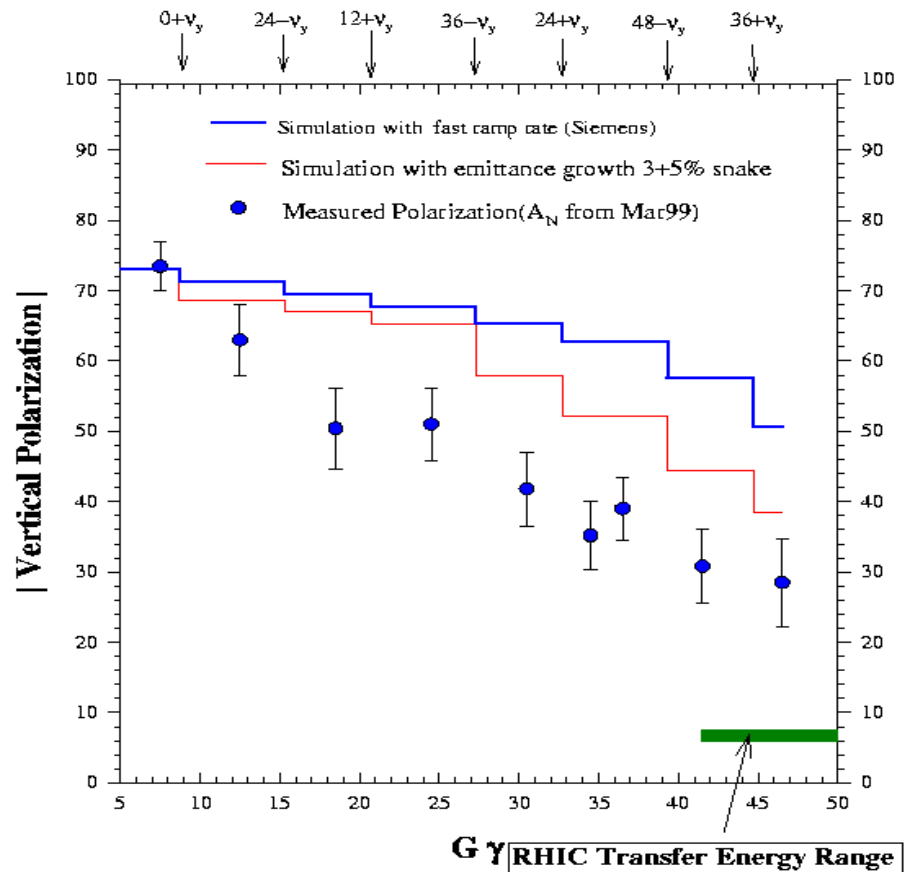
- Run Status
- Hardware and Software Improvements
- Plans

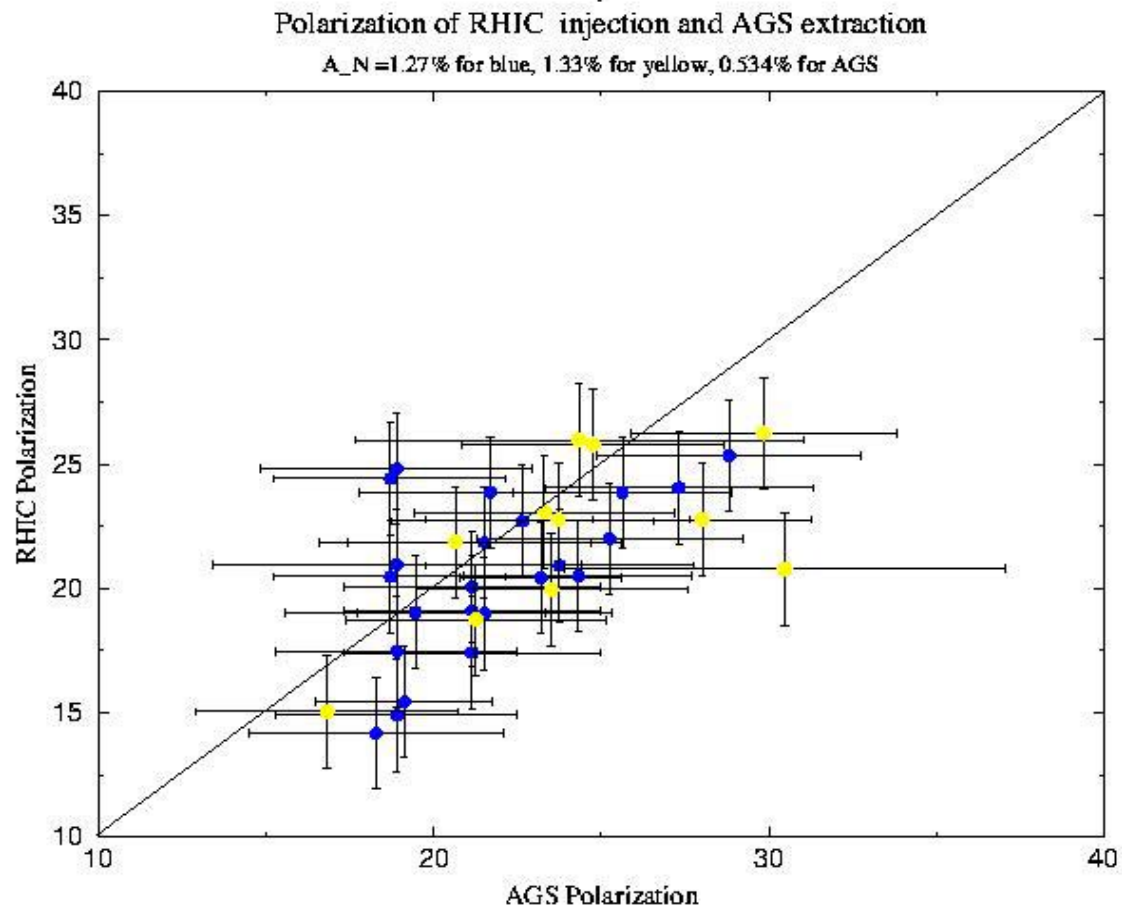
Status of the Run

- Source Polarization $\sim 70\%$
- Polarization at $G\gamma=7.5 \sim 70\%$ (with fwd arms)
- AGS extraction polarization 20-30%. No clear intensity dependence.
- 3% snake not strong enough around $\sim 20\text{GeV}/c$.
- Slower ramp rate caused more polarization loss along the ramp.
- More emittance growth due to slower ramp rate (AC dipole on/off at $36+\nu$ did not make much difference).
- J10 bump jitter caused orbit move by ± 5 mm at injection.
- Two power amplifiers were used to power AC dipole to get stronger AC dipole pulse.
- Tune jump was tried at various weak intrinsic resonances, but did not show improvement.
- With $\nu_y=8.97$, a 10% snake can overcome the intrinsic resonance.

AGS Performance

- Resonances corrected with AC dipole: $0+\nu$, $12+\nu$, $36-\nu$.
- Experiment points were taken in sequential runs. Not all points were with optimized conditions.
- Blue curve is simulation with fast ramp rate for Siemens.
- J10 bump jitter caused orbit move by ± 5 mm at injection. How much polarization loss can be blamed on it?





AGS Problems

- No Siemens (slower ramp rate)
- Emittance large (due to the slower ramp rate?). Need to understand the mechanism.
- J10 bump P/S problem. Not clear of its effect on beam polarization.
- Each polarization measurement takes 20-30 minutes.
- No horizontal tune measurement.
- AC dipole drive not easy to switch from different modes.

Software Development

- Better function editor for snake function
- Automatically monitor 4 AC dipole 1/PUE amplitude(still LabVIEW?)
- User friendly orbit correction program
- AC dipole drive modification
- Automatic logging parameters such as emittances; 1/PUE amplitude; betatron tunes; modulation tunes and asymmetries.

Hardware Development

- SC 20% snake (not available for next run FY03)
- CNI Polarimeter for AGS

The design is similar to RHIC ones. With wider target and more bunches in the AGS (+-+ -+-), it can measure polarization at flat top in one minute. It is also possible to measure polarization along the ramp (emittance blow up may be a issue?).

- Multiple users to switch back and forth for different energies.
- AC dipole and Snake user switchable.

Plan for Next Run

- Have CNI polarimeter ready.
- Ask for three weeks parasitic running time in the AGS with Siemens back on line.
- The goal is to reach 50% at the AGS extraction.